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**The following text was derived from the description provided by the National Resources Canada (NRC). Please visit the Space Weather Canada website for additional information. It would be appropriate to acknowledge the NRC Space Weather Canada in any public use of these data.**

# About the Solar Flux Data

The database available here comprises two components: measurements of the 10.7cm Flux and daily records of flux monitor output. Each measurement of the 10.7cm Solar Flux is expressed in three values: the *observed*, *adjusted* and *URSI Series D* values.

The *observed* value is the number measured by the solar radio telescope. This is modulated by two quantities: the level of solar activity and the changing distance between the Earth and Sun. Since it is a measure of the emissions due to solar activity hitting the Earth, this is the quantity to use when terrestrial phenomena are being studied.

When the Sun is being studied, the annual modulation of the 10.7cm Solar Flux by the changing distance between the Earth and Sun is undesirable. However, one byproduct of the ephemeris calculations needed for the solar flux monitors to properly acquire and track the Sun is the distance between the Sun and the Earth. We therefore produce an additional quantity, corrected for variations in the Earth-Sun distance, and given for the average distance. This is called the *Adjusted* value.

Absolute measurements of flux density are quite difficult, and in the early years of solar radio astronomy, considerable effort around the world went into making absolute measurements of the solar flux density at a number of different frequencies. An attempt was then made to fit all these various data to a spectrum. Each set of measurements was then given a scaling factor that would move them right onto the fitted spectrum. For the 10.7cm Solar Flux a scaling factor of 0.9 was estimated. In the light of later work, this work should possibly be redone. However, we also give in the database the *Series D Flux*, which is the *adjusted* value multiplied by 0.9.

Three flux determinations are made each day. Between March and October measurements are made at 1700, 2000 (local noon) and 2300UT. However, the combination of location in a mountain valley and a relatively high latitude make it impossible to maintain these times during the rest of the year. Consequently, from November through February, the flux determination times are changed to 1800, 2000 and 2200, so that the Sun is high enough above the horizon for a good measurement to be made.

The record for each measurement of the 10.7cm Solar Flux is as below. The quantities are separated by commas. The 10.7cm Solar Flux is given in solar flux units (an sfu = $10^{-22}.m^{-2}.Hz^{-1}$).

- The Julian Day of the measurement (see Note 1)
- The Carrington Rotation Number (see Note 2)
- The year

- The month
- The day
- The *observed* flux
- The *adjusted* flux
- The *Series D* flux.

**Note 1** : The Julian Day is a simple day count starting at noon on 1st January, 4713 BC. It is convenient for long-term astronomical observations, such as the study of variable stars, because no date decoding is necessary and (for European astronomers) avoids a date transition in the middle of an observing night.

**Note 2**: *Carrington Rotation Number* is the number of times the Sun has rotated since 9th November, 1853. Since solar activity is often localized in longitude, and the rotation period of roughly 27 days is close to a month, monthly averaging can generate *beats* in the amplitude of the averages which can give produce spurious indications of the appearance and decay of active structures. It is therefore often better to average over a solar rotation than over a month.